HORIZONTAL ACCELERATOR

The Horizontal Accelerator Facility (HA), located at the Naval Air Warfare Center Aircraft Division (NAWCAD), Patuxent River, Maryland, is certified for operational testing and evaluation of various systems in crash environments. The heart of the facility is a HYGE accelerator capable of providing controllable and repeatable time-mirrored crash pulses simulating the conditions which occur during a crash on land or in water. Managed and operated by the U.S. Navy's Crew Systems Department, the HA has the technical staff, a Prototype Development and Preparation Lab, and fabrication facilities for test article preparation, standardized testing, and data analysis.

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The Horizontal Accelerator has supported the U.S. Navy in tests and evaluation of rigid and energy-attenuating seats, ejection seats, clothing assemblies, restraints and body-mounted equipment. Specific U.S. Navy programs which have used the Horizontal Accelerator include the V-22 Crashworthy Troop Seats, Inflatable Body and Head Restraint System (IBAHRS), Integrated Night Vision Goggles (I-Nights), Non-Development Item (NDI), Troop Seats, and the Navy Aircrew Common Ejection Seat (NACES). Results obtained through horizontal accelerator testing have been used to improve the safety and survivability of U.S. military aviators and aircrew flying military missions. In addition, the facility has been used by other branches of the armed services and governmental agencies for safety and crashworthiness evaluation, and by the automotive industry for research and development.

The HYGE accelerator is a pneumatically-driven, hydraulically-controlled linear actuator with a 100-foot test rail and control center that can simulate vehicle/occupant forces, displacements, and accelerations of an actual crash. It produces time-mirrored acceleration pulses which are programmable and highly repeatable, with a 50 G maximum acceleration and a 5000 lb. maximum payload at 20 G's.

The data acquisition system consists of 64-channels capable of sampling at 10,000 Hz/channel with real-time and post-impact filtering. Video results of the anthropomorphic manikins (Hybrid III and Aerospace) and sled impact are obtained using high-speed video-film (1000 frames/sec) and still photography from all critical angles. The continued upgrades to the control system and data acquisition system have resulted in a state-of-the-art crash test facility.

For more information, contact the Horizontal Accelerator Facility at the Naval Air Warfare Center Aircraft Division, Patuxent River, MD at 301-342-8439.